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What is claimed is:

1. A method for secure transmission of an information-containing optical signal, comprising:

dividing the optical signal into a first plurality of sub-bands,
modifying each of the first plurality of sub-bands to encrypt the information contained in the optical signal,
combining the modified first plurality of sub-bands into a combined optical signal,
dividing the combined optical signal into a second plurality of sub-bands,
modifying each of the second plurality of sub-bands to decrypt the previously encrypted information contained in the optical signal.

2. The method of claim 1 wherein the information-containing optical signal has a bandwidth and at least one of the first and second plurality of sub-bands has a sub-band resolution at least 50 times finer than the bandwidth of the information-containing optical signal.

3. The method of claim 1 wherein the information-containing optical signal is transmitted at a bit rate of not less than 1 gigabit per second.

4. The method of claim 1 wherein the information-containing optical signal is transmitted at a bit rate of not less than 10 gigabits per second, wherein at least the first plurality of sub-bands comprise not less than 50 sub-bands and wherein at least the first plurality of sub-bands has a spatial resolution at a focal plane of not greater than 200 MHz.

5. The method of claim 1 wherein the first plurality of sub-bands comprise not less than 100 sub-bands.

6. The method of claim 1 wherein at least one of the steps of modifying each of the first plurality of sub-bands and modifying each of the second plurality of sub-bands comprises at least one of imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each sub-band.

7. The method of claim 6 comprising at least one of imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each sub-band at a rate that changes over time.

8. The method of claim 1 comprising imparting a frequency shift to the input information-containing optical signal.

9. A system for secure transmission of an information-containing optical signal, comprising:

at least a first OTDL configured to enable division of the optical signal into a first plurality of sub-bands,

at least a first phase modulator configured to enable modification of each of the first plurality of sub-bands to encrypt the information contained in the optical signal, the first OTDL being configured to enable combining the modified first plurality of sub-bands into a combined optical signal,

at least a second OTDL configured to enable division of the combined optical signal into a second plurality of sub-bands,

at least a second phase modulator configured to enable modification of each of the second plurality of sub-bands to decrypt the information previously encrypted, the second OTDL being configured to enable combining the modified second plurality of sub-bands into a combined optical signal.

10. The system of claim 9 comprising:

at least a third OTDL configured to enable division of each of the first plurality of sub-bands into a plurality of finer sub-bands, and wherein at least the first phase

modulator is configured to enable modification of each of the plurality of finer sub-bands to encrypt the information contained in the optical signal.

11. The system of claim 9 wherein at least one of the first and second phase modulator comprises a reflective phase modulating array.

12. The system of claim 9 wherein at least one of the first and second phase modulator comprises a transmissive phase modulating array.

13. The system of claim 9 comprising at least one computer for controlling at least one of modification of the first plurality of sub-bands by the first phase modulator and modification of the second plurality of sub-bands by the second phase modulator

14. The system of claim 9 wherein at least one of the first and second phase modulator comprises at least one of a liquid crystal array, a MEMS device, an array of III-V or II-VI semiconductor devices.

15. The system of claim 9 wherein
at least a first pair of OTDL configured to enable division of the optical signal into a first plurality of sub-bands,
at least a second pair of OTDL configured to enable division of the combined optical signal into a second plurality of sub-bands,
wherein at least one of the first and second phase modulator comprises a transmissive phase modulating array.

16. The system of claim 9 wherein the first phase modulator is configured to enable modification of each of the first plurality of sub-bands by at least one of imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each sub-band, and wherein the second phase modulator is configured to enable modification of each of the second plurality of sub-bands at least one of

imparting a phase shift to each sub-band, imparting a time delay to each sub-band, and imparting a frequency shift to each sub-band.